Chief Reader Report on Student Responses:

2024 AP® Macroeconomics Set 1

Free-Response Questions

• Number of Students Scored	160,741		
• Number of Readers	252		
• Score Distribution	Exam Score	N	%At
	5	33,218	20.7
	4	33,198	20.7
	3	38,269	23.8
	2	33,433	20.8
	1	22,623	14.1
• Global Mean	3.13		

The following comments on the 2024 free-response questions for AP® Macroeconomics were written by the Chief Reader, Samuel Andoh, Professor of Economics, Southern Connecticut State University. They give an overview of each free-response question and of how students performed on the question, including typical student errors. General comments regarding the skills and content that students frequently have the most problems with are included. Some suggestions for improving student preparation in these areas are also provided. Teachers are encouraged to attend a College Board workshop to learn strategies for improving student performance in specific areas.

Question 1

Task: Calculate, Graph, Assert, Explain
Topic: Unemployment, Aggregate Demand-Aggregate Supply, Long-Run Self-Adjustment, Monetary Policy with Ample Reserves, Reserve Market
Max Score: 10
Mean Score: 3.48

What were the responses to this question expected to demonstrate?

The question examined students' understanding of the aggregate demand–aggregate supply model in a recessionary gap environment, self-adjustment to full employment in the long run, and the effects of monetary policy in a banking system with ample reserves on the reserve market, the price of previously issued bonds, and the price level.

The question begins by asking students to assume that the hypothetical economy of Alpha is in short-run equilibrium with a cyclical unemployment rate of 3%, a frictional unemployment rate of 4%, and an actual unemployment rate of 8%.

In part (a) students are asked to calculate the natural rate of unemployment and to show their work.

In part (b) students are asked to draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, show (i) the current equilibrium real output and price level, labeled Y_1 and PL_1, respectively, and (ii) the full-employment output, labeled Y_F.

In part (c) students are asked to assume that policymakers take no action to close the output gap and to (i) explain how Alpha's economy will adjust to full-employment in the long-run and (ii) show on the graph in part (b) how Alpha's economy will adjust to full employment in the long-run, labeling the new equilibrium price level PL_2.

In part (d) students are asked to assume that Alpha's central bank is considering using monetary policy to close a recessionary output gap. The banking system in Alpha has ample reserves. Students are asked to identify a specific monetary policy action the central bank of Alpha would take to close the output gap in the short run.

In part (e) students are asked to draw a correctly labeled graph of the reserve market in Alpha, and show the effect of the monetary policy action identified in part (d) on the policy rate.

Finally, in part (f), based on the change in the policy rate shown in part (e), students are asked what will happen to (i) the price of previously issued bonds and (ii) the price level and to explain.

How well did the responses address the course content related to this question? How well did the responses integrate the skill(s) required on this question?

In part (a) 39% of students earned the point by correctly calculating the natural rate of unemployment as 5% and for showing their work.

Part (b) had two points. 80% of students earned the first point by drawing a correctly labeled aggregate demand-aggregate supply graph showing PL_1 and Y_1 at the intersection of the aggregate demand and short-

run aggregate supply curves. 69% of students earned the second point by correctly placing the long-run aggregate supply curve to the right of the short-run equilibrium Y_1 and labeling the full-employment output as Y_F.

Part (c) had two points. In part (c)(i), 38% of students earned the point by correctly explaining how Alpha's economy will self-correct in the long run, and in part (c)(ii), 54% of students earned the point by correctly shifting the short-run aggregate supply curve to the right on the graph in part (b) until it intersects the AD and LRAS curves at a lower price level, labeled PL_2.

In part (d) 32% of students earned the point by correctly stating that the central bank of Alpha would decrease its administered interest rates or decrease interest on reserves.

Part (e) had two points. 15% of students earned the first point by drawing a correctly labeled graph of the reserve market with the supply of reserves curve intersecting the demand for reserves curve in the range of ample reserves. 15% of students earned the second point by showing a decrease in the lower bound of the demand for reserves curve, resulting in a decrease in the policy rate.

Part (f) had two points. 39% of students earned the first point by correctly stating that the price of previously issued bonds would increase, and the price level would increase. 25% of students earned the second point by correctly explaining that the price level will increase because the decrease in nominal interest rates will increase interest-sensitive spending, which will increase aggregate demand.

What common student misconceptions or gaps in knowledge were seen in the responses to this question?

Common Misconceptions/Knowledge Gaps	Responses that Demonstrate Understanding
Part (c)(i) • Difficulty with explaining the long-run self-adjustment mechanism. Responses often showed an awareness that the short-run aggregate supply curve would shift to the right to restore long-run equilibrium but did not explain the cause of the shift as a decrease in input prices (e.g., nominal wages) and/or inflationary expectations. Some responses misattributed the long-run adjustment process to a shift in aggregate demand rather than short-run aggregate supply or explained using automatic stabilizers as the mechanism.	• An explanation of long-run self-adjustment that includes a decrease in input prices (e.g., nominal wages) and/or inflationary expectations as the cause of an increase in short-run aggregate supply.

Part (d)	
• Proposing monetary policy tools appropriate for a banking system with limited reserves (e.g., buying bonds or decreasing the required reserve ratio) rather than one with ample reserves. • Proposing fiscal policy tools (e.g., increasing government spending or decreasing taxes) rather than monetary policy tools. • Not differentiating between the action that the central bank takes when implementing monetary policy (i.e., changing administered interest rates or interest on reserves) and the target/effect of that monetary policy action (i.e., changing the policy rate).	• Stating that the central bank should decrease administered interest rates or decrease interest on reserves, which are monetary policy actions that are appropriate for addressing a recessionary gap in a banking system with ample reserves.
Part (e)	
• Drawing a money market graph or AD-AS graph rather than a reserve market graph. • Drawing graphs that had the general shape of the demand for reserves and supply of reserves curves but then labeling those curves as the demand for money and the supply of money. • Including a demand for reserves curve but no supply of reserves curve. • Shifting the entire demand for reserves curve rather than just the horizontal bounds of the demand for reserves curve.	• Drawing a correctly labeled graph of the reserve market with the supply of reserves curve intersecting the demand for reserves curve in the range of ample reserves. • Showing a decrease in the administered interest rates or a decrease in the lower bound of the demand curve for reserves, resulting in a decrease in the policy rate.

Part (f)	
• Not understanding the inverse relationship between interest rates and the price of previously issued bonds. • Not explaining the causal link between interest rate changes and changes in interest-sensitive components of aggregate demand; many responses recognized that lower interest rates would increase aggregate demand but did not explain how interest-sensitive spending would cause the increase in aggregate demand.	• Stating that the price of previously issued bonds would increase, and the price level would increase as a result of the decrease in nominal interest rates. • Explaining that the decrease in nominal interest rates will increase interest-sensitive spending (consumption, investment, or net exports), which will increase aggregate demand.

Based on your experience at the AP® Reading with student responses, what advice would you offer teachers to help them improve student performance on the exam?

- Teach how central banks carry out monetary policy in a banking system with ample reserves.

What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?

Use the resources that have been released by the College Board for teaching monetary policy with ample reserves, which include:

- Two videos for teachers explaining the updates, available in AP Classroom (Course Guide => Overview => Teacher Resources).

- Three revised practice exams, available on the AP Course Audit site and in AP Classroom.

- Revised progress check questions, topic questions, question bank questions, and AP Daily videos available in AP Classroom.

The Federal Reserve Bank of St. Louis has also developed a number of helpful resources for teaching the new tools of monetary policy that are available on its website: https://www.stlouisfed.org/education/teaching-new-tools-of-monetary-policy.

Question 2

Task: Calculate, Assert, Explain
Topic: Real GDP, Money Market, Inflation, Real v. Nominal Variables
Max Score: 5
Mean Score: 1.76

What were the responses to this question expected to demonstrate?

The question examined students' ability to calculate economic indicators such as real GDP, real GDP per capita, and inflation; to interpret those values; and to explain their effects.

The question begins by providing hypothetical data for the country of Louland, which includes nominal GDP in year 1 and year 2, population in year 1 and year 2, and the GDP deflator in year 2. Students are told that the base year is year 1.

In part (a) students are asked to calculate real GDP in Louland in year 2 and to show their work.

In part (b) students are asked how the change in real GDP from year 1 to year 2 would affect the demand for money and the nominal interest rate in year 2.

In part (c) students are asked if the standard of living of the average citizen in Louland increased, decreased, or remained the same from year 1 to year 2 and to explain using numbers.

In part (d) students are asked for the numerical value of the inflation rate from year 1 to year 2.

Finally, in part (e), students are asked what happened to workers' real wages from year 1 to year 2 if nominal wages increased by 10% during this time and to explain their response.

How well did the responses address the course content related to this question? How well did the responses integrate the skill(s) required on this question?

In part (a) 43% of students earned the point by correctly calculating the real GDP in Louland in year 2 as 900,000 and for showing their work.

In part (b) 40% of students correctly stated that the demand for money would increase and the nominal interest rate would increase.

In part (c) 36% of students correctly stated that the standard of living of the average citizen in Louland decreased from year 1 to year 2 and explained that the real GDP per capita in year 1 was 800 and the real GDP per capita in year 2 was 750.

In part (d) 27% of students correctly stated that the inflation rate from year 1 to year 2 was 15%.

In part (e) 46% of students correctly stated that real wages decreased and explained that nominal wages increased by less than the inflation rate.

What common student misconceptions or gaps in knowledge were seen in the responses to this question?

Common Misconceptions/Knowledge Gaps	Responses that Demonstrate Understanding
Part (c) • Incorrectly using nominal GDP per capita rather than real GDP per capita to represent the standard of living of the average citizen.	• An explanation of a decrease in the standard of living that mentioned the decrease in the real GDP per capita from 800 in year 1 to 750 in year 2.
Part (d) • Not understanding that the GDP deflator is a price index and can therefore be used to calculate the inflation rate.	• Determining the inflation rate of 15% by calculating the percentage change in the GDP deflator.

Based on your experience at the AP® Reading with student responses, what advice would you offer teachers to help them improve student performance on the exam?

• Have students work out problems to reinforce concepts and help them make inferences from their calculations or graphs.

What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?

Sign in to AP Classroom to access AP Daily videos and find questions on the topics and skills addressed in this question. AP teachers can assign the short AP Daily videos as homework, warm-ups, lectures, reviews, and more. AP teachers can also use the AP Question Bank in AP Classroom to enable students to practice and get feedback on formative topic questions and past AP Exam questions. Additional resources are available in the Classroom Resources section of the AP Macroeconomics course page on AP Central.

Question 3

Task: Assert, Explain, Graph
Topic: Fiscal Policy, Loanable Funds Market, Foreign Exchange Market
Max Score: 5
Mean Score: 1.74

What were the responses to this question expected to demonstrate?

The question examined students' understanding of fiscal policy actions and their impact on the real interest rate and the foreign exchange market.

Students are asked to assume that Malaysia's economy is in a recession and that the government has a balanced budget.

In part (a) students are asked to identify a specific fiscal policy action the government would implement to address the recession.

In part (b) students are asked how the fiscal policy action in part (a) will affect the real interest rate in Malaysia and to explain.

In part (c) students are told to assume that Malaysia and Japan are trading partners with flexible exchange rates. Students are asked to draw a correctly labeled graph of the foreign exchange market for the ringgit relative to the yen and to show the effect of change in the real interest rate identified in part (b) on the international value of the ringgit.

Finally, in part (d), based on the change in the value of the ringgit in part (c), students are asked if Malaysia's imports will increase, decrease, or remain the same and to explain.

How well did the responses address the course content related to this question? How well did the responses integrate the skill(s) required on this question?

In part (a) 75% of students correctly stated that Malaysia's government would increase spending, decrease taxes, or increase transfer payments.

In part (b) 30% of students correctly stated that the real interest rate will increase and explained that the demand for loanable funds will increase (or the supply of loanable funds will decrease).

Part (c) had two points. 39% of students earned the first point by drawing a correctly labeled graph of the foreign exchange market for the ringgit. 30% of students earned the second point by showing an increase in the demand for the ringgit (or a decrease in the supply of the ringgit), resulting in an appreciation of the ringgit.

In part (d) 33% of students correctly stated that Malaysia's imports would increase and explained that the ringgit's appreciation would make Japanese goods relatively less expensive than they were before.

What common student misconceptions or gaps in knowledge were seen in the responses to this question?

Common Misconceptions/Knowledge Gaps	Responses that Demonstrate Understanding
Part (b) • Incorrectly stating that the real interest rate will decrease as a result of an increase in government spending or a decrease in taxes. • Not linking the change in the real interest rate to the loanable funds market.	• Stating that the real interest rate will increase and explaining that the demand for loanable funds will increase, or the supply of loanable funds will decrease.
Part (c) • Incorrectly labeling the vertical axis of the foreign exchange market graph for the ringgit. • Shifting the demand for the ringgit or the supply of the ringgit in the wrong direction. • Not indicating a change in the value of the ringgit.	• Drawing a correctly labeled graph of the foreign exchange market for the ringgit and showing an increase in the demand for the ringgit (or a decrease in the supply of the ringgit), resulting in an appreciation of the ringgit.
Part (d) • Not explaining the relative change in the price of goods between the two countries.	• Stating that Malaysia's imports will increase and explaining that the appreciation of the ringgit will make Japanese goods relatively less expensive than they were before.

Based on your experience at the AP® Reading with student responses, what advice would you offer teachers to help them improve student performance on the exam?

- Have students practice explaining their assertions in class.
- Help students understand what a foreign exchange rate is by using everyday examples.

What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?

Sign in to AP Classroom to access AP Daily videos and find questions on the topics and skills addressed in this question. AP teachers can assign the short AP Daily videos as homework, warm-ups, lectures, reviews, and more. A longer faculty lecture on Unit 6 is available in AP Classroom, which discusses the determination of exchange rates, changes in equilibrium exchange rates, and the balance of payments. AP teachers can also use the AP Question Bank in AP Classroom to enable students to practice and get feedback on formative topic questions and past AP Exam questions. Additional resources are available in the Classroom Resources section of the AP Macroeconomics course page on AP Central.